

INSTRUCTIONS FOR OPERATION  
OF  
CITIZEN-SHIP MODEL SSH-P  
SINGLE CHANNEL SUPERHETERODYNE RECEIVER

CITIZEN-SHIP RADIO CORPORATION  
810 EAST 64TH STREET  
INDIANAPOLIS, INDIANA

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DRAWINGS

INSTRUCTIONS FOR OPERATION  
OF  
CITIZEN-SHIP MODEL SSH-P  
SINGLE CHANNEL SUPERHETERODYNE RECEIVER

1. INSTRUCTIONS FOR INSTALLATION AND OPERATION OF MODEL SSH-P RECEIVER.

- A. Your CITIZEN-SHIP SSH-P Receiver is a highly selective, miniaturized, relayless, super-heterodyne crystal-controlled tone operated receiver that will operate on any of the F.C.C. frequency assignments from 26.995 through 27.255 MHz with no interference from a transmitter on any of the other five frequencies. This receiver is designed to be operated by the CITIZEN-SHIP NPT Transmitter to obtain proportional control. The SSH-P is primarily intended to operate open-loop proportional control actuators of the Rand and Galloping Ghose variety; however, it will operate CITIZEN-SHIP Escapements PSN-2, SE-2, and SE-2-M with no modification.
- B. This receiver, when used with Escapements, will operate only from a Tone Modulated transmitter tuned to the correct frequency. CITIZEN-SHIP Models SPX and TTX are especially designed to operate it and should be used. However, our SL-6 or TMS and many other tone transmitters with an audio frequency of 400-1000 cycles may also be used when tuned up with the proper crystal. (An on-off carrier transmitter will not operate this set).
- C. The SSH-P Receiver is shipped adjusted and tuned for reception on the frequency which is stamped on the box. The transmitter used must, of course, be tuned and adjusted to transmit on the frequency for which the receiver is operating.
- D. Before you become alarmed at the frequency of the crystal in the receiver, the frequency of the receiver crystal is always 0.455mc lower than the frequency at which the transmitter operates. Example: If you have a receiver tuned for 27.145, the receiver crystal should read 26.690 (i.e.  $27.145 - .455 = 26.690$ ).

2. CRYSTALS AND SELECTION OF OPERATING FREQUENCY OF RECEIVER.

- A. If you desire to select another of the available 27 MHz frequencies, and feel that you can not or do not wish to do the work yourself, you may ship the set to CITIZEN-SHIP and we will exchange crystals and realign and retest the set for \$2.50. (The receiver crystal is soldered in place, and although eyelets are provided to facilitate resoldering a different crystal, care must be used not to damage the circuit board.)  
  
Your transmitter will also need to have the crystal change to match your receiver. Instructions with your CITIZEN-SHIP transmitter describe how you can change crystals and re-tune the set with the use of a field strength meter. If you prefer to ship the set to us for this work, charges will be \$2.50 for it also. No transmitters other than those manufactured by CITIZEN-SHIP will be adjusted.
- B. Warning! It is absolutely essential to obtain crystals of the correct frequency and tolerance. Because of the selectivity of the receiver, the crystals must be ground to a tolerance of .0025%.
- C. Crystals must be used in pairs as follows:

TRANSMITTER CRYSTAL FREQ.	RECEIVER CRYSTAL FREQ.
27.255 MHz	26.800 MHz
27.195 MHz	26.740 MHz
27.145 MHz	26.690 MHz
27.095 MHz	26.640 MHz
27.045 MHz	26.590 MHz
26.995 MHz	26.540 MHz

### 3. ACTUATORS

#### A. Open-loop Proportional Actuator.

The SSH-P is designed to operate open-loop proportional actuators such as the Rand Dual or GG Pak. These actuators may be purchased separately from your hobby dealer. The receiver will also operate other brands of actuators.

- #### B. CITIZEN-SHIP Escapements available for operation with this receiver, the PSN-2 or the SE-2, are best suited for proper operation of the SSH-P with Escapements. Other types, however, may also be used. In general, 8 to 10 ohm escapements work best. It is advisable to use the lightest weight escapement rubber possible, a 1/8" loop being recommended. See escapement instructions.

### 4. WIRING

#### A. Open-loop Proportional:

The SSH-P is prewired with a plug to match the two Rand Actuators, and no soldering is necessary.

#### B. With CITIZEN-SHIP Escapements:

The SSH-P requires only 2.4 to 3 Volts and is intended for operation on two pen cells when used with either the CITIZEN-SHIP PSN-2 or SE-2 Escapement, or the CITIZEN-SHIP SE-2-M Escapement for quick blip motor control. (See Figure 1).

#### C. With Other Escapements:

Escapements produced by some manufacturers pull in at 1.8 Volts or even higher. This does not give enough safety factor when two cells are used for receiver and escapement. Figure 2 shows wiring with three cells (recommended for all escapements with 1.8 Volt or higher pull-in values).

### 5. BATTERY REQUIREMENTS

- #### A. Rand Manufacturing Co., supplies a prewired nicad battery pack with the Dual or GG pak which also provides power for the SSH-P.

- #### B. For operation with Escapements, Energizer Type pen cells can give extended battery life and improved reliability of operation. Two excellent types are the Eveready No. 1015 and E91. The 1015 has the advantage of lower cost, more easily obtained, and lighter in weight. However, this cell is constructed with what is known as a "false bottom." This cap must be removed before soldering to the cell by carefully cutting the cardboard case approximately 3/64" from the negative end.

The E91 is of similar construction, but the cap is welded to the inner electrode and must not be removed.

Nicads should have a 450 or 500 MA Hour capacity.

### 6. END USE OF BATTERIES WITH ESCAPEMENTS.

#### A. Pen Cells

Discard batteries when voltage of each cell drops to 1.1 Volts with signal being received from transmitter. After battery drops below 2.2 Volts escapement may still pull in, but range will be greatly reduced.

#### B. Nicads

See manufacturer's instructions for recharging.

### 7. MOUNTING

- #### A. The CITIZEN-SHIP SSH-P Receiver has two recommended mounting positions: with the

printed circuit base vertical and forward, or horizontal and downward. The vertical position is definitely more crash-proof. If space is available, completely wrapping the receiver in 1/4" to 3/4" thick sponge rubber is ideal. Make the width of the sponge 2-1/2" or more and the length enough to make the wrapped receiver fit snugly between the fuselage sides.

Another good mounting method is to use a vertical removable plywood board with receiver on one side and batteries on the other. Sponge rubber with 1/2" - 3/4" thickness or some other shock protection material should be used between receiver base and plywood to protect the receiver. Either rubber bands or glue may be used to secure the receiver to the sponge rubber. Do not glue the entire printed circuit base as this makes very difficult any repairs to the receiver that might be necessary. Use glue only at the ends of the receiver and possibly one spot in the center.

## 8. ANTENNA

- A. Several arrangements of antenna are possible. A stiff steel wire at least 18" long may be mounted vertically at any convenient point and the antenna lead from the receiver to the top of the rudder fin. Another effective type is a wire from the receiver to the tip of the stabilizer and continuing on to the top of the rudder and down to the other side of the stabilizer.
- B. A total length of 30" to 45" should be used. Leave some slack in the antenna lead into the receiver, but do not wind this lead in and around other wiring as range might be reduced.

## 9. RETUNING AND ADJUSTING

- A. The SSH-P Receiver is tuned and adjusted at the factory; therefore, retuning is not necessary.  
If ground range is adequate (2 to 2-1/2 blocks) retuning is not necessary nor recommended.
- B. Range Testing  
Operating range should be approximately 2 blocks on the ground and much greater in the air. Do not attempt to retune the set as the Warranty will be voided. Low batteries and not enough antenna length are the major causes of range problems.

## WARRANTY

Your CITIZEN-SHIP Model SSH-P Receiver is warranted by the manufacturer to be free from defects in material and workmanship. However, the transistors are known to be operative from testing of the set and we cannot guarantee them against damage caused by incorrect voltage.

Any receiver failing to operate within 30 days after date of purchase will be repaired or replaced free of charge upon being returned to the factory by the owner. DO NOT return the unit to the distributor or dealer for service. This warranty does not apply to failure of operation due to exhausted or improper batteries.

If your receiver is damaged in shipment, you should file a claim with the carrier immediately upon noting the damage.

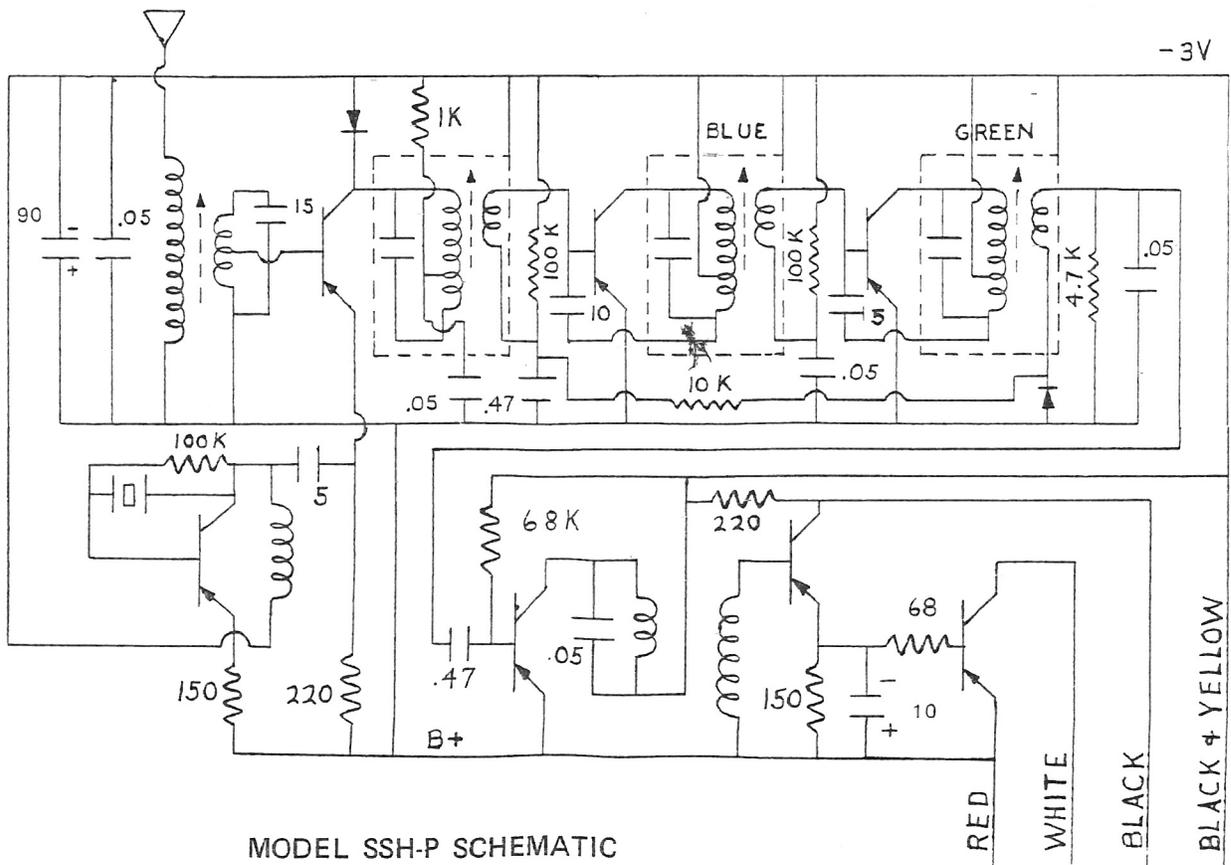
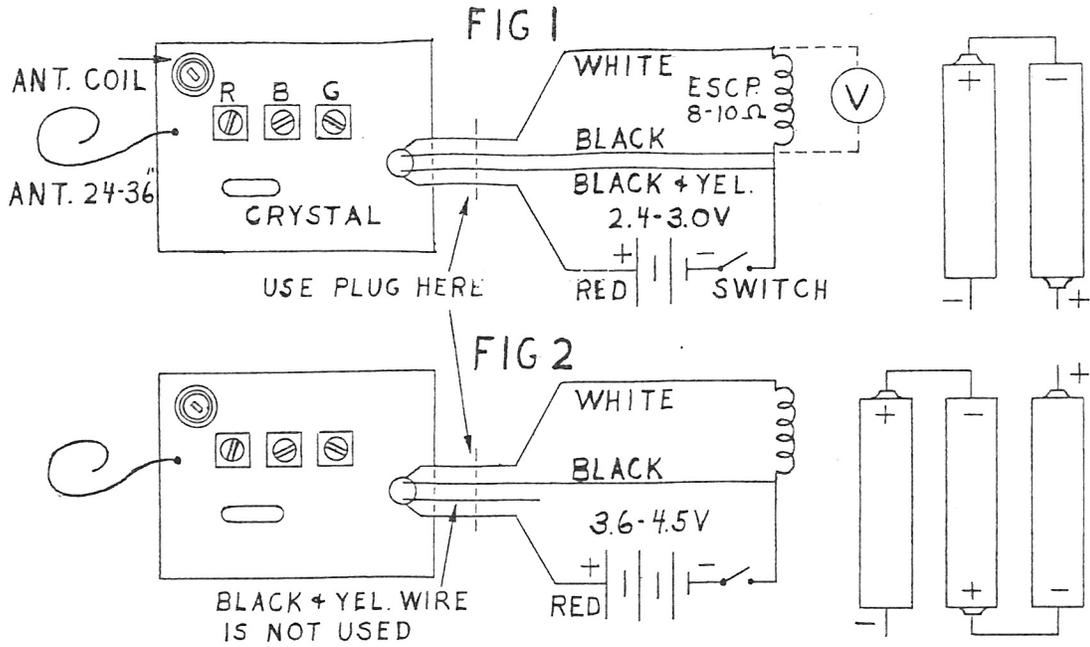
This warranty does not apply if, in our judgement, the receiver has been tampered with or received abusive treatment beyond that encountered in normal usage.

CITIZEN-SHIP RADIO CORPORATION

810 East 64th Street

Indianapolis, Indiana 46220

# MODEL SSH-P WIRING DIAGRAMS FOR ESCAPEMENT APPLICATION



MODEL SSH-P SCHEMATIC